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Dräger medical

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Field Service Procedure

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Narkomed 6000 Series
Software Version 3.01 Enhancement

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Narkomed 6000 Series
Software Version 3.01 Enhancement

SOFTWARE INSTALLATION PROCEDURE

CAUTION: If the machine is configured for Air Only Mode, as identified by an identification label near the Serial Number label, a special process for obtaining the properly configured Keylok is required. Refer to step 1.21 for additional information.

1.0 Software Version, System RAM Verification & Mechanical Modifications

1.1 With the NM6000 System Power switch at STANDBY, connect a keyboard P/N 4115133 to the DIN connector on the underside of the NM6000 cockpit area. See FIGURE 1.

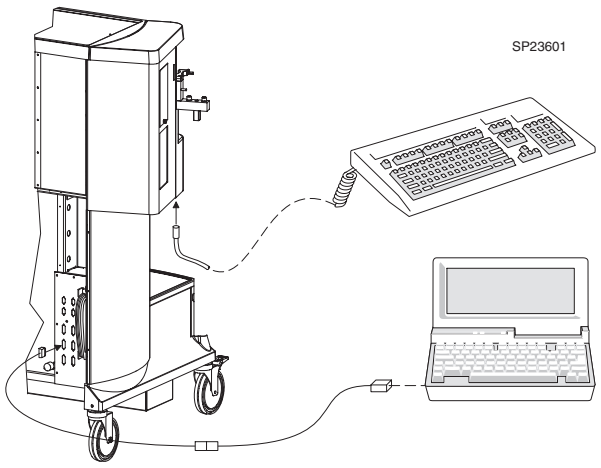

FIGURE 1. Keyboard Connections

1.2 Turn the System Power switch to ON. Press the Divan Standby key and wait for the NM6000 to complete its startup sequence.

1.3 Access the main Service Mode screen. Select the Workstation tab. Record the WPU (Processor Unit) serial number listed on the NM6K Service Mode page for future reference. Refer to FIGURE 2.

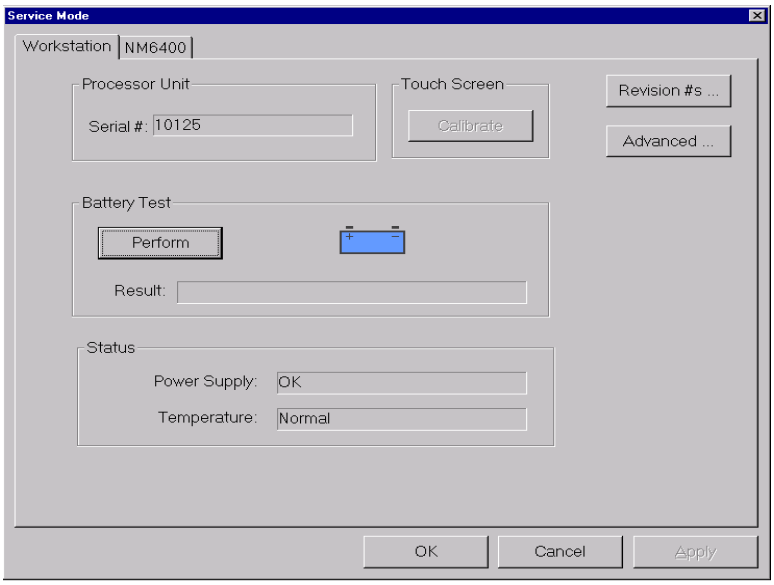

FIGURE 2. Serial Number Location

1.4 On the keyboard connected to the NM6000, press the ESC key several times. The next sequence of steps must be performed quickly and in this exact order:

- Press and hold the CTRL key, press and hold the F9 key, release the CTRL key, release the F9 key.
- Press and hold the ALT key, press and hold the F9 key, release the ALT key, release the F9 key.

NOTE: You may need to repeat the previous step several times to disable the keyboard filter if you are not able to perform the next step. While the filter is active, no keystrokes are passed on to any application or the operating system. The following steps will not work if you are NOT successful in disabling the keyboard filter. THERE ARE NO PHYSICAL INDICATIONS THAT THE FILTER HAS BEEN DISABLED.

1.5 On the keyboard connected to the NM6000, press the Windows key or CTRL+ESC keys to bring up the Start menu.

1.6 Select 'Settings->Control Panel' from the task bar.

NOTE: When navigating using the touch screen, use a narrow blunt object for making selections. When an item is selected it will be highlighted and a dotted line will appear around the text.

1.7 On the Control Panel dialog, select the 'System' icon and then press Enter.

1.8 On the System Properties dialog, select the 'General' tab. Identify the amount of system RAM. If the amount of RAM is less than 64,000 kB, the system requires a RAM update. Refer to the location identified by the box shown in FIGURE 3.

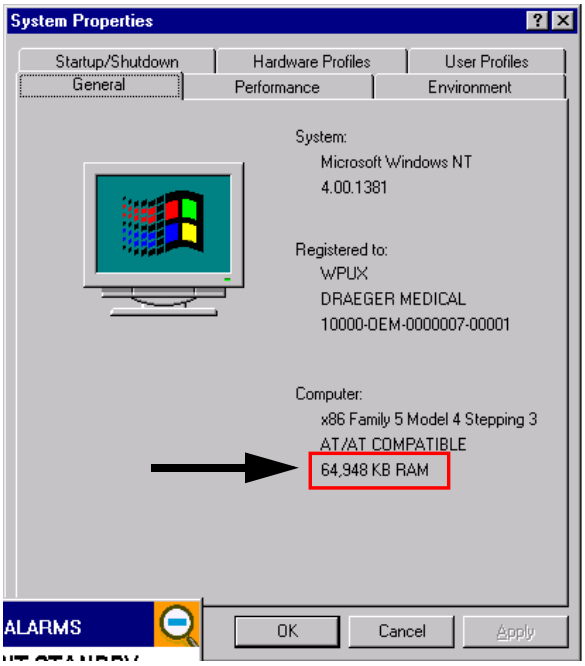

FIGURE 3. System Properties

CAUTION: Version 3.01 software requires at least 64 Meg RAM to operate properly. Failure to comply with this precaution may result in a WPU or related system failure.

NOTE: If the system does not require a RAM update, and Software options VENT SOUNDS with TEMPLATES, AIR ONLY MODE, or VENT SOUNDS with TEMPLATES & AIR ONLY MODE will not be installed, then skip to Section 3.0. If the system requires a RAM update or RAM update and Keylok options, continue with the next step. If the system requires Keylok options, skip to TBD.

NOTE: The Low Flow Wizard is a standard feature of 3.01 software and does not require a Keylok for activation. If the Low Flow Wizard was previously installed, its removal is not required unless another software option requiring a Keylok is installed.

1.9 Turn the System Power switch to STANDBY.

1.10 Remove AC power from the machine and wait approximately 3 minutes for system shut down, as indicated by an extinguished greed LED on the Vitalbus HUB, then pull all circuit breakers to their 'out' position.

WARNING: Before servicing, ensure that AC power is removed from the machine and all circuit breakers are disengaged (pulled out). Failure to observe this precaution may cause injury by electric shock.

CAUTION: Use ESD precautions when handling any of the electronics assemblies. These assemblies contain static sensitive components.

1.11 Close all cylinder valves and remove the cylinders from their yokes.

1.12 Remove the Vitalbus Hub mounting hardware (do not disassemble the hinge hardware). Remove the power cord strain relief retainer and swing open the assembly.

1.13 Remove the lower left back panel mounting hardware and remove the panel from the machine.

1.14 Remove the row of power supply cables closest to the WPU assembly.

1.15 Remove the WPU cover.

1.16 Locate the RAM modules. See FIGURE 4.

1.17 Un-clip one of the RAM module retainers and remove the PCB from the motherboard.

1.18 Remove the existing RAM modules and install the four RAM modules provided in the kit.

Verify all RAM modules are perpendicular to the motherboard and the retaining clips at each end of the modules are properly secure. The round section of the clip shall be snapped into place on the component (right) side of the RAM module to make proper connection. The arrow in FIGURE 5. shows an example of an un-clipped memory module.

1.19 Apply a 64 Meg label over the RAM section of the WPU cover label.

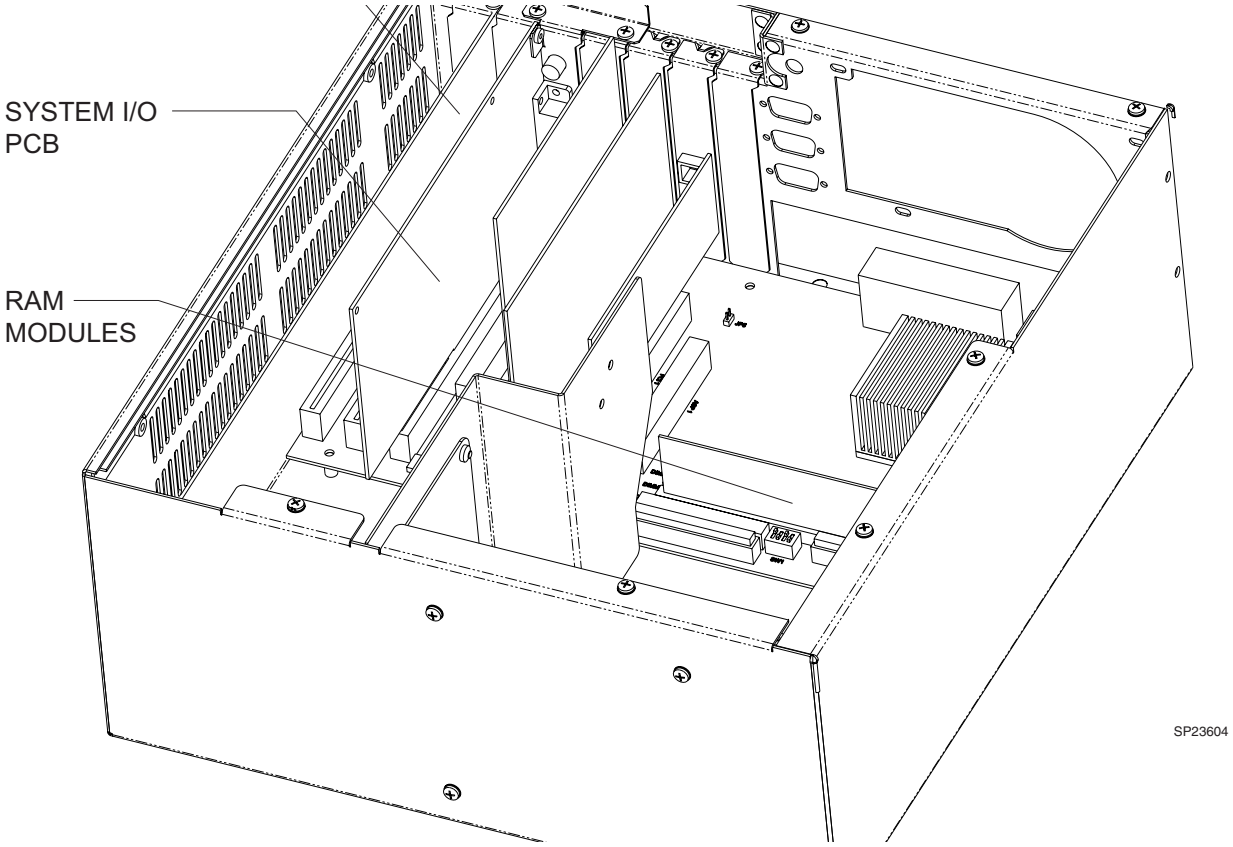

FIGURE 4. RAM Module Location

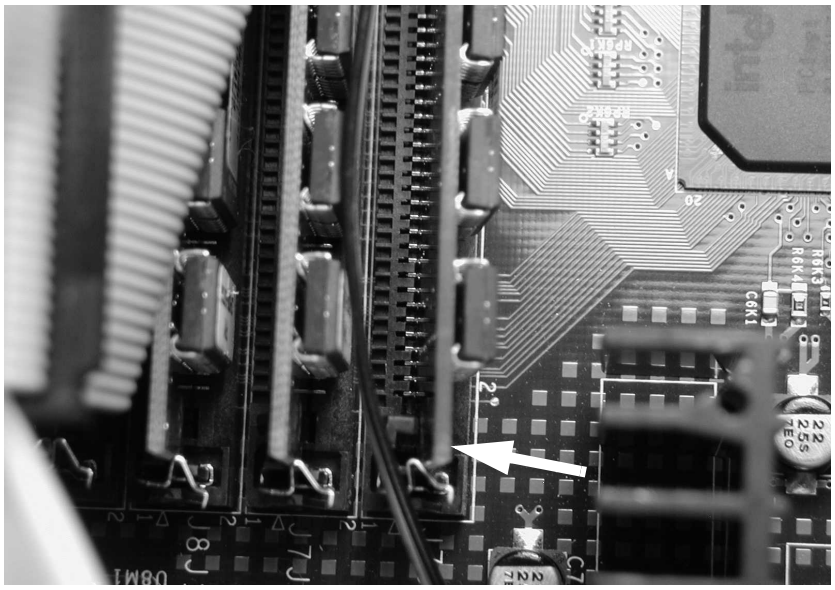

FIGURE 5. Example of an Un-Clipped Memory Module

WARNING: The 'Air Only Mode' software option requires the machine to be configured with an Air yoke assembly and fitted with an Air cylinder containing at least 1000 psi.

NOTE: The Low Flow Wizard is a standard feature of 3.01 software and does not require a Keylok for activation. If the Low Flow Wizard was previously installed, its removal is not required unless another software option requiring a Keylok is installed.

1.20 Locate the WPU parallel printer port. If the port has a previously installed Keylok assembly, remove it.

1.21 Skip this step if the removed Keylok was not identified as Air Only Mode.

If an Air Only Keylok was removed to accommodate the installation of the Templates/Sounds Keylok, do not discard either Keylok. A special Keylok to enable Templates/Sounds/Air Only options will be required to re-enstate these features. The properly configured Keylok for Templates/Sounds/Air Only (P/N 4116920-005) is sold separately and full credit will be issued upon the RMA return of the original Air Only Keylok (P/N 4116920-002) and Templates/Sounds Keylok (P/N 4116920-004) contained in kit Base 3.0 Software with Templates and Sounds (P/N 4117630-001). Contact Draeger Medical's Customer Care Department if you have either not received this special Keylok or you do not know of the RMA number that is required for the return of the original Keylok. Properly package both Keyloks with the enclosed RMA's, then return them to Draeger Medical's Receiving Department.

1.22 Install the correctly configured Keylok in the WPU parallel printer port and secure it using a small slotted screwdriver. See FIGURE 6.

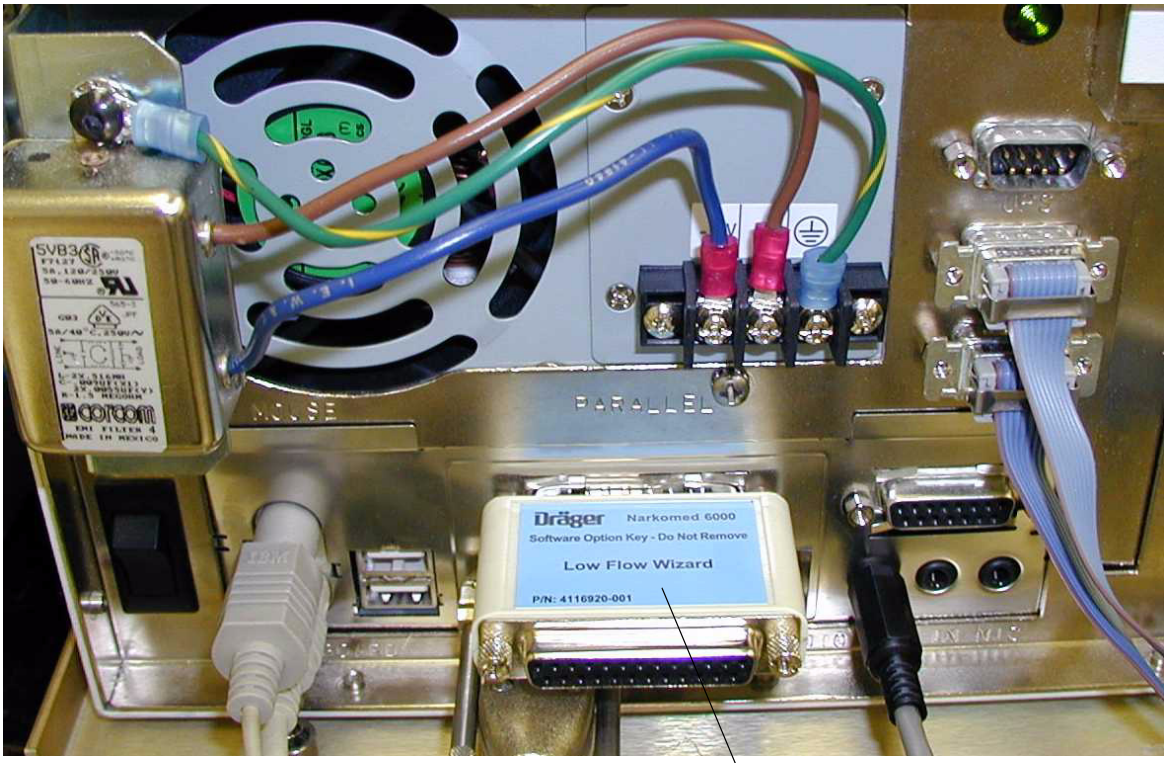

FIGURE 6. Typical Keylok Location

1.23 Reinstall the WPU cover.

1.24 Reconnect and secure the cables previously removed from the power supply assembly.

1.25 Reinstall the back panel on the machine.

1.26 Swing the Vitalbus Hub door closed. Reattach the power cord strain relief retainer and reinstall the previously removed hardware.

1.27 Route the power cord's strain relief with a loop in a clockwise direction. The retaining clamp shall be located 17 inches (5¼ in. diameter) from the cord end, and secured to the Vitalbus Hub door using the mounting hole directly above the power cord socket as shown in FIGURE 7.

1.28 Reinstall the cylinders in their yokes.

1.29 Restore AC power to the machine and enable the circuit breakers.

1.30 Proceed to Section 3.0.

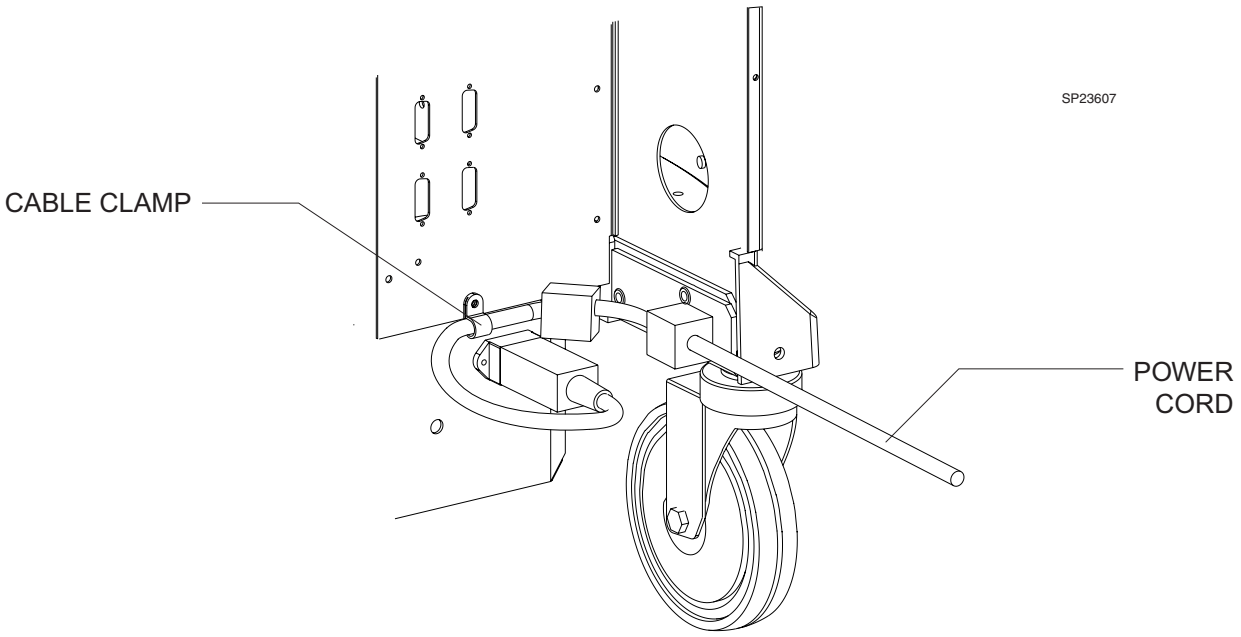

FIGURE 7. Power Cord Routing

2.0 Keylok Option Installation for machine not requiring RAM update:

WARNING: The Air Only Mode software option requires the machine to be configured with an Air yoke assembly and fitted with an Air cylinder containing at least 1000 psi.

NOTE: The Low Flow Wizard is a standard feature of 3.01 and does not require a Keylok for activation. If the Low Flow Wizard was previously installed, its removal is not required unless another software option requiring a Keylok is installed.

2.1 Turn the System Power switch to STANDBY.

2.2 Remove AC power from the machine. Wait at least 3.5 minutes, then pull all circuit breakers to their out position.

WARNING: Before servicing, ensure that AC power is removed from the machine and all circuit breakers are disengaged (pulled out). Failure to observe this precaution may cause injury by electrical shock.

CAUTION: Use ESD precautions when handling any of the electronic assemblies. These assemblies contain static sensitive components.

2.3 Remove all Vitalbus cables from the Vitalbus Hub assembly.

2.4 If any communication cables are attached to the Vitalbus assembly, note the location and remove the cable.

2.5 Remove the Vitalbus Hub mounting hardware (do not disassemble the hinge hardware). Remove the power cord strain relief and swing open the assembly.

2.6 Locate the WPU parallel printer port. If the port has a previously installed Keylok assembly, remove it. See FIGURE 6.

2.7 Skip this step if the removed Keylok was not identified as Air Only Mode.

If an Air Only Keylok was removed to accommodate the installation of the Templates/Sounds Keylok, do not discard either Keylok. A special Keylok to enable Templates/Sounds/Air Only options will be required to re-enstate these features. The properly configured Keylok for Templates/Sounds/Air Only (P/N 4116920-005) is sold separately and full credit will be issued upon the RMA return of the original Air Only Keylok (P/N 4116920-002) and Templates/Sounds Keylok (P/N 4116920-004) contained in kit Base 3.0 Software with Templates and Sounds (P/N 4117630-001). Contact Draeger Medical's Customer Care Department if you have either not received this special Keylok or you do not know of the RMA number that is required for the return of the original Keylok. Properly package both Keyloks with the enclosed RMA's, then return them to Draeger Medical's Receiving Department.

2.8 Install the correctly configured Keylok in the WPU parallel printer port and secure it using a small slotted screw driver.

2.9 Swing the Vitalbus Hub door closed. Reattach the power cord strain relief retainer and reinstall the previously removed hardware.

2.10 Route the power cord strain relief with a loop in a clockwise direction. The retaining clamp shall be located 17 inches (5¼ in. diameter) from the cord end, and secured to the Vitalbus Hub door using the mounting hole directly above the power cord socket as shown in FIGURE 7.

2.11 Reinstall the Vitalbus cables previously removed from the Vitalbus Hub assembly.

2.12 Reinstall any communication cables to their original location.

2.13 Restore AC power to the machine and enable the circuit breakers.

3.0 Installing the NM6k Software Version 3.01:

3.1 Configure the laptop computer to communicate with the Narkomed 6000 Series. Refer to Section 2 of the Narkomed 6000 Series Technical Service Manual for the appropriate NM6K Series Event Log Transfer procedure based on the laptop computer's operating system. After the initial laptop configuration and after configuration changes are made, verify proper setting by successfully completing an event log transfer.

NOTE: If the laptop is provided with a modem card separate from the LAN card, disable or remove it during this procedure.

NOTE: These instructions assume that the NM6000 3.01 installation wizard program was previously run to load the CD-ROM files on to the laptop hard drive. If this was not done, do it now as follows:

a. Close all Windows Programs.

b. Insert the Narkomed 6000 3.01 Software CD-ROM into the CD ROM drive of the laptop.

c. If the laptop drive is not set up to auto run, browse the CD using Windows Explorer and double click Set-up.exe.

d. At the "Welcome to NM6000 Transfer Program" dialog box, click "Next".

e. At the "Remove Existing Components" dialog box, select the 'Clear All" button if you do not want to uninstall any previous software versions or select any or all previous software versions you wish to uninstall from your laptop, then click "Next".

f. At the "Select Component" dialog box, select "NM6000 Version 3.01" and deselect 'TRAM Version 10A' then click "Next" to begin loading the program onto the laptop.

g. At the "Transfer Results" dialog box, verify the NM6000 3.01 files were transferred, then click "Next".

h. Close any open windows then turn off the laptop.

3.2 With the NM6000 System Power switch at STANDBY and the laptop power switched off, connect the Vitalbus cable P/N 4113989-001 or 4113898-002 to any Vitalbus port (J4 thru J7) on the NM6000. Connect the other end of the cable to the laptop's LAN card as shown in FIGURE 8.

CAUTION: Before connecting an external computer to the Narkomed 6000, verify the computer is running a virus protection application set to scan all files and is enabled. You must also verify that the scan engines and definition files are of current vintage.

NOTE: If the laptop is provided with a modem card separate from the LAN card, disable or remove it during this procedure.

3.3 Power on the NM6K and press the Divan Standby key to abort the self-test, then wait for the NM6K to complete startup.

3.4 Power up the laptop and enter your normal user name and password.

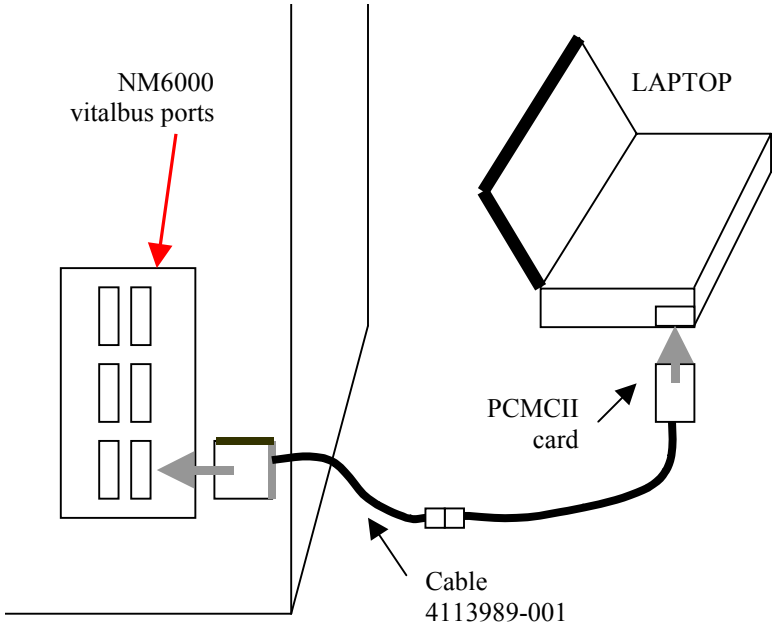

FIGURE 8. Laptop Connection Example

3.5 On the keyboard connected to the NM6000, press the ESC key several times. The next sequence of steps must be performed quickly and in this exact order:

- Press and hold the CTRL key, press and hold the F9 key, release the CTRL key, release the F9 key.
- Press and hold the ALT key, press and hold the F9 key, release the ALT key, release the F9 key.

NOTE: You may need to repeat the previous step several times to disable the keyboard filter if you are not able to perform the next step. While the filter is active, no keystrokes are passed on to any application or the operating system. The following steps will not work if you are NOT successful in disabling the keyboard filter. THERE ARE NO PHYSICAL INDICATIONS THAT THE FILTER HAS BEEN DISABLED.

3.6 On the keyboard connected to the NM6000, press the Windows key or CTRL+ESC keys to bring up the Start menu.

3.7 Select 'Settings->Control Panel' from the task bar.

NOTE: When navigating using the touch screen, use a narrow blunt object for making selections. When an item is selected it will be highlighted and a dotted line will appear around the text.

3.8 On the Control Panel dialog, select the 'ELO Touchscreen' icon then press Enter. See FIGURE 9.

NOTE: If there are multiple ELO Touchscreen listings, select the first entry.

FIGURE 9. Control Panel Example

3.9 On the ELO Touchscreen dialog, press the 'Calibrate' button. See FIGURE 10.

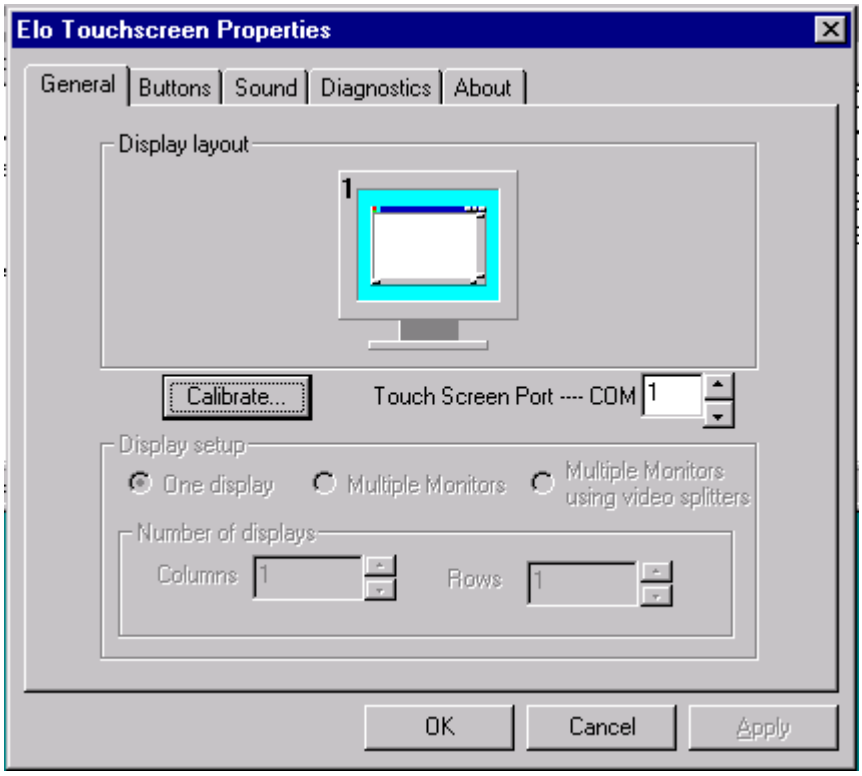

FIGURE 10. Touchscreen Dialog

3.10 Touch the screen at the specified three locations. Verify that the touchscreen is calibrated by touching at different locations. Verify that you can position the cursor accurately in all four corners.

3.11 Select the Sound tab and verify 'Enable Click Sounds' is not selected, then press OK. If 'Enable Click Sounds' is selected, deselect it, then press OK.

3.12 Touch the 'X' to close the control panel dialog box.

3.13 Press Ctrl+Alt+Delete to display the Windows NT Security dialog box as shown in FIGURE 11.

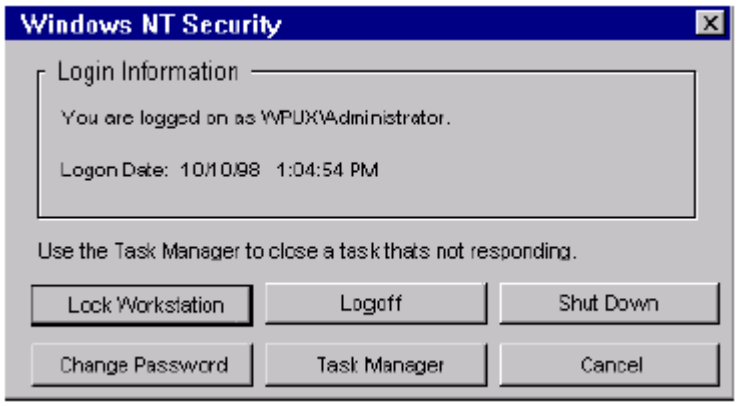

FIGURE 11. Windows NT Security

3.14 Touch the 'Task Manager' button to launch the Windows NT Task Manager dialog.

3.15 Touch the 'Applications' tab page.

NOTE: If you do not see any tabs, the Task Manager view has collapsed. To see an expanded view, touch the Task Manager dialog box near the middle along the right edge of the frame.

3.16 Using the cursor, select the 'SYSTEM 1 MANAGER' application.

3.17 Touch the 'End Task' button.

3.18 Touch the 'Processes' tab page.

3.19 Touch the screen at the 'GSPLUS.exe' file.

3.20 Touch the 'End Process' button.

3.21 Touch 'Yes' to end the task.

3.22 On the keyboard connected to the NM6000, type 'Alt+F4' to close the Windows NT Task Manager.

3.23 On the keyboard connected to the NM6000, press the Windows key or 'Ctrl+Esc', then select 'Programs->Windows NT Explorer' from the task bar.

3.24 From the menu list at the top of the Explorer window select 'Tools', 'Map Network Drive...' then press Enter. Refer to FIGURE 12.

3.25 Touch the 'Drive:' dropdown arrow and select the 'E:' drive.

3.26 Touch the 'Path' dropdown arrow and select your previously entered path name as '\\srvlap\NAD Software' path if using Windows 95 or Windows 98, or Windows ME. If you are a Draeger Medical employee using Windows NT or Windows XP, you must use your unique computer name in the field path, i.e.: '\\srvlap042\NAD Software', or '\\L98474\NAD Software'. If the path is not found, touch the 'Path' field to move the cursor, then use the keyboard connected to the NM6000 to enter this information

3.27 Ensure that the 'Reconnect at Login' check box is deselected. Click OK.

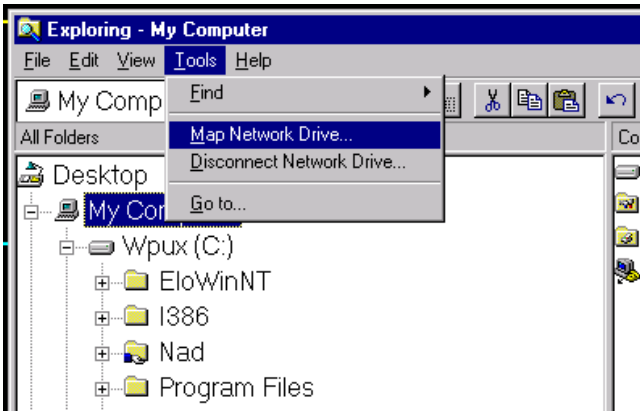

FIGURE 12. Exploring: Map Network

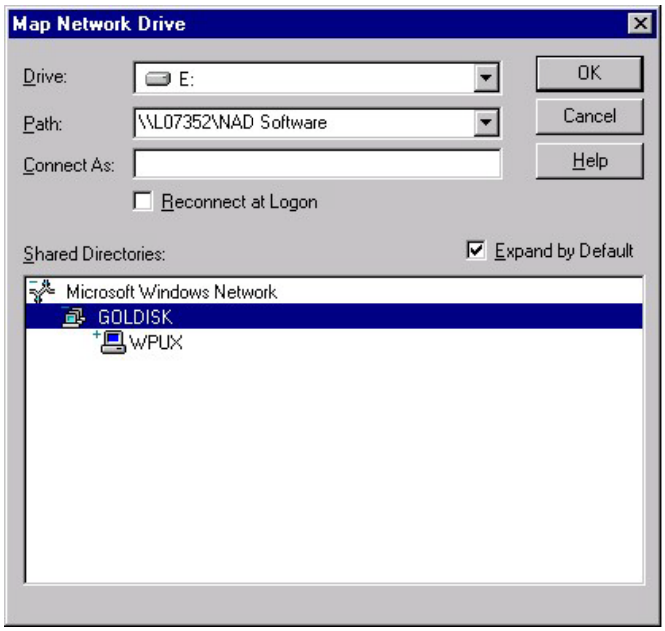

FIGURE 13. Map Network Drive Dialog

3.28 Using the keyboard connected to the Narkomed 6000, press F5 to refresh the display.

3.29 On the NM6000 Series display screen, select “NAD Software on (E:)’. See FIGURE 14.

3.30 Select the ‘nadsetup’ folder and press Enter, then select ‘v3.01’ folder and press Enter.

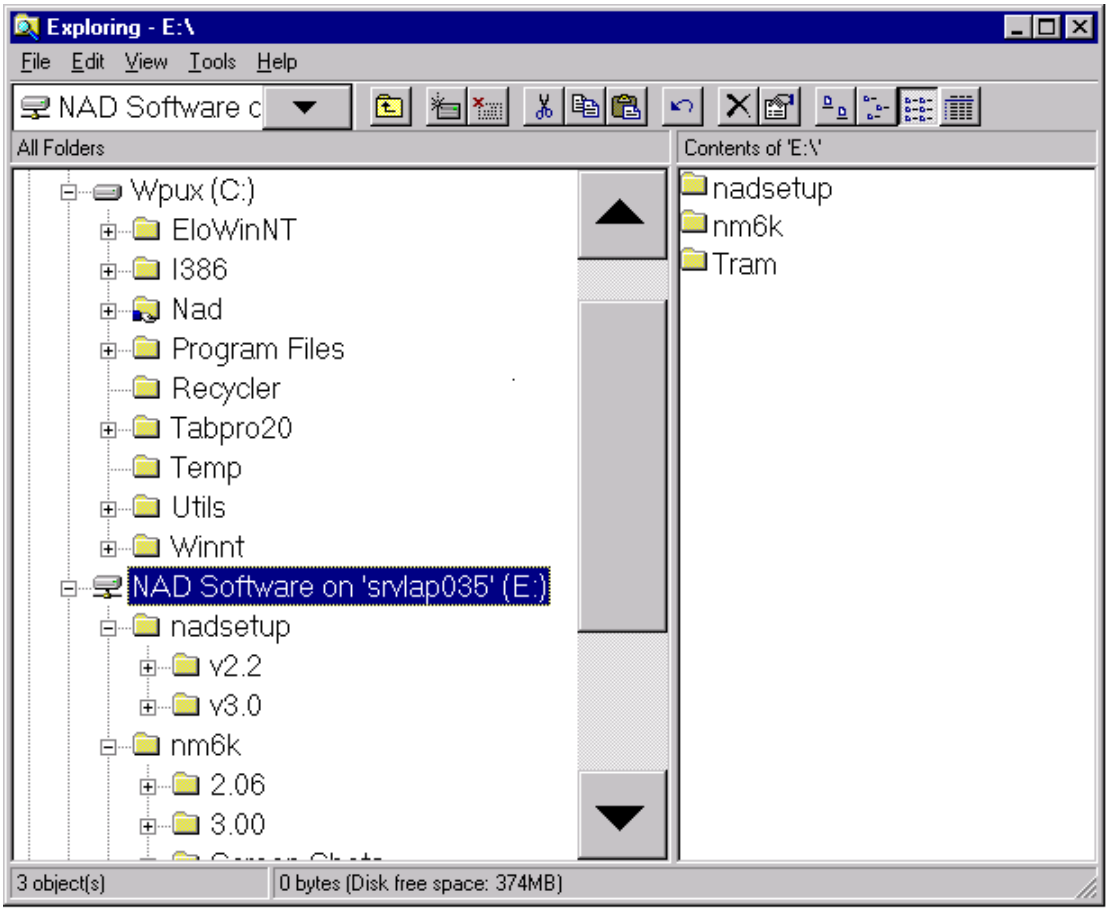

FIGURE 14. Typical NAD Software Dialog

3.31 Use the arrow key on the keyboard connected to the NM6000 to select ‘Install.bat’ file, then press Enter to run the NAD Install program.

3.32 On the ‘NAD Installation’ dialog ensure that ‘NM6K’ is selected as the program, and click the ‘Install’ button. See FIGURE 15.

3.33 Touch the ‘Enter NAD dir’ field. Then using the keyboard connected to the NM6000, type in the source directory as ‘E:\NM6K\3.01’ and press Enter. See FIGURE 16.

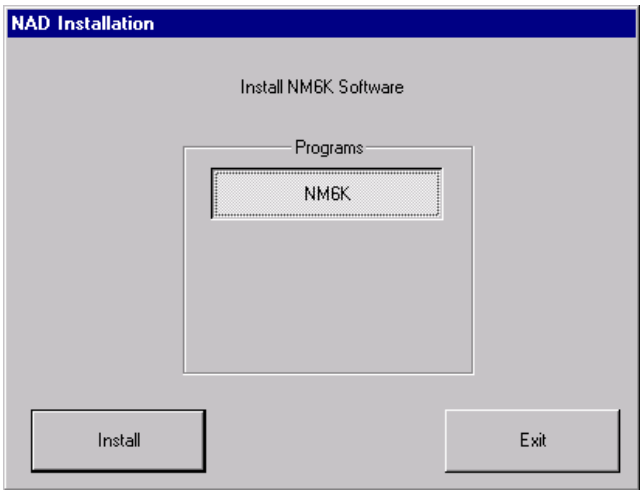

FIGURE 15. Example 'NAD Installation' Dialog

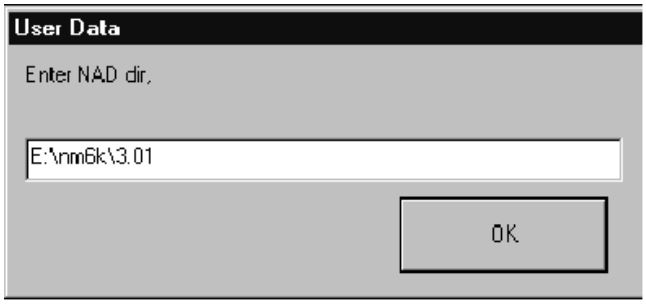

FIGURE 16. Typical Source Directory Dialog

3.34 Examine the communication ports on the Vitalbus assembly. At the 'Is isocomm board installed?' dialog box (shown in FIGURE 18.), select the 'Yes' button if there are four (4) communication ports. Select the 'No' button is there is only one (1) communication port.

CAUTION: Failure to select the proper communication port(s) configuration will result in a system diagnostic failure at start-up and the machine will be rendered conditionally functional, causing the WPU to keep rebooting. If isocomm was selected but only one (1) communication port exists, or if the isocomm board exists but was not selected, the Service Menu Comm Port selection will be limited to only one (1) (non-functional) port when four (4) ports exist.

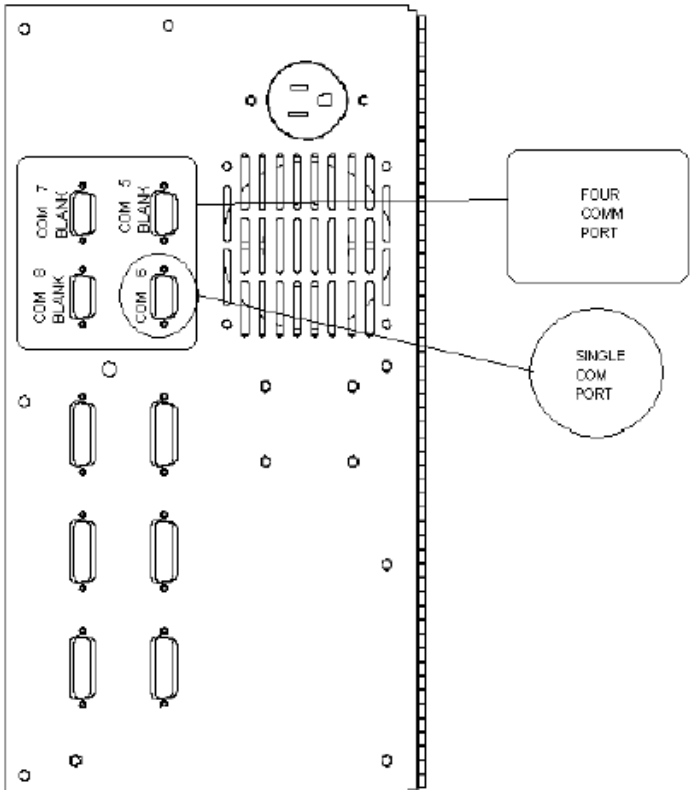

FIGURE 17. Vitalbus Communication Port Options

FIGURE 18. Isocomm Dialog

3.35 Verify the Nm6kmsg.dll = 0x3DBC, CVP = ”1.05 PODCVSW” - 0xE406, SCR - “1.02 POD SCR” - 0xFED3 data displayed on the “User Info” dialog box. See FIGURE 19.

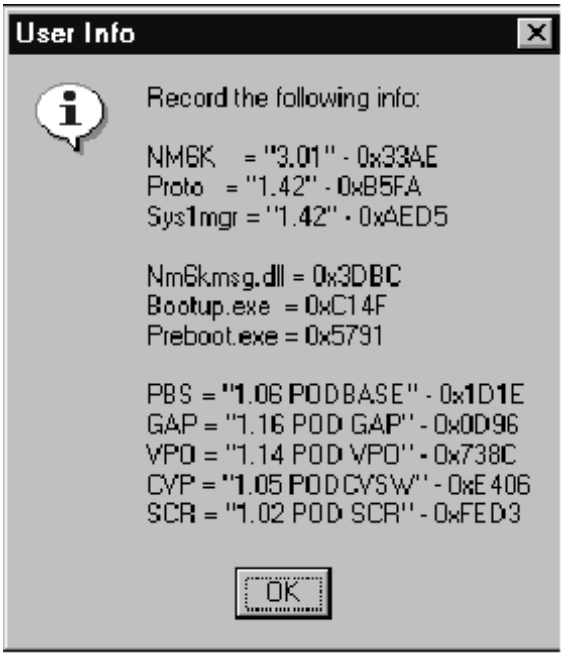

FIGURE 19. Typical Version Data Dialog

Item	Expected Value	Actual Value
NM6K Version	3.01	
NM6K CRC	0x33AE	
Proto Version	1.42	
Proto CRC	0xB5FA	
Sys 1mgr Version	1.42	
Sys 1 mgr CRC	0xAED5	
NM6kmsg.dll CRC	0x3DBC	
Bootup.exe CRC	0xC14F	
Preboot.exe CRC	0x5791	
PBS Version	1.06	
PBS CRC	0x1D1E	
GAP Version	1.16	
GAP CRC	0x0D96	
VPO Version	1.14	
VPO CRC	0x738C	
CVP Version	1.05	
CVP CRC	0xE406	
SCR Version	1.02	
SCR CRC	0xFED3	

3.36 If the WPU serial number is correct, touch the ‘OK’ button to continue. If the serial number is incorrect, touch the ‘WPU Serial Number’ field, then using the keyboard attached to the NM6000 type in the serial number previously recorded in Step 1.3. Then touch the ‘OK’ button to continue. See FIGURE 20.

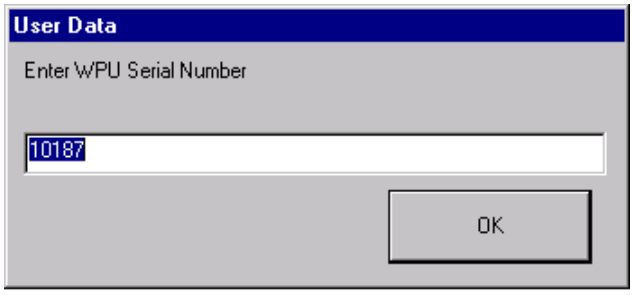

FIGURE 20. Typical Serial Number Dialog

3.37 Touch the 'OK' button for the Registry Editor Dialog. See FIGURE 21.

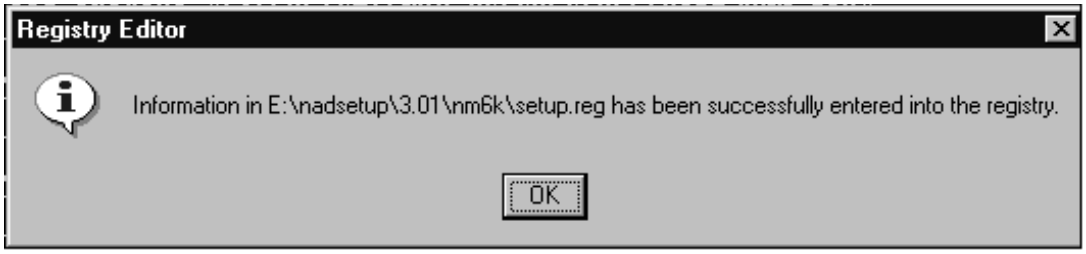

FIGURE 21. Registry Editor Dialog

3.38 Touch the 'OK' button on the 'Installation Completed' dialog. See FIGURE 22.

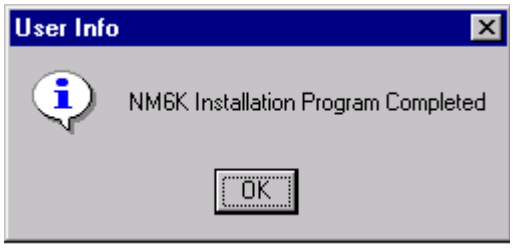

FIGURE 22. Reboot Machine Dialog

3.39 The machine will reboot at this time. It could take several minutes to complete. After the machine reboots, sys1mgr will automatically start.

NOTE: If there are new pod images, the images will be loaded to the pods on the first startup. This process is automatic and upon its completion the system self diagnostic tests will continue.

3.40 If the system is functional, skip to step 3.41. Or, if the system is conditionally functional and reboots when pressing the acknowledgement key, perform the following steps:

CAUTION: Failure to select the proper communication port(s) configuration may result in system diagnostic failure at start-up, causing the machine's WPU to keep rebooting. To recover from this error, should it occur, you must perform the following. Step 3.39.2 should be started as soon as you see the Windows Start key displayed on the monitor and step 3.39.3 must be completed before the self-diagnostic system status dialog is displayed on the monitor. Repeat steps 3.39.1 through 3.39.3 if the system continues to reboot.

3.40.1 Initiate a system reboot by pressing the SYSTEM CONDITIONALLY FUNCTIONAL button.

3.40.2 Wait until you see the Windows Start key appear, then unlock the keyboard connected to the NM6000 by performing step 1.4.

3.40.3 Shut down the SYSTEM 1 MANAGER and gsplus.exe by performing steps 3.13 through 3.21.

3.40.4 Proceed with the installation beginning at step 3.23.

3.41 Access the Primary Service screen. (Refer to Accessing the Service Screens in Section 2.1 of the Narkomed 6000 Series Technical Service Manual.)

3.42 Access the Advanced Service Mode. (Refer to Accessing the Service Screens in Section 2.2 of the Narkomed 6000 Series Technical Service Manual.) Select Service Config key, NM6K tab, select the SERVICE button and enter your Technicians ID#.

3.43 If the machine requires the activation or reactivation of an Audible O2 Whistle, *Vent Sounds or *Air Only Mode optional feature, touch the Options tab in the NM6000 CONFIGURATION notebook to access the OPTIONS page. Touch the correct key to toggle the corresponding option to Enabled.

*Denotes a feature that requires a Software Option Keylok attached to the WPU parallel port for its activation.

NOTE: The Low Flow Wizard is enabled by default. If its deactivation is desired, toggle its setting to 'Not Installed.'

3.44 Press the Service Monitors key and select the Ports tab. If four (4) communication ports were identified in step 3.34, verify they are properly listed on the Port Configuration Page Notebook. If they are not listed correctly, reload the software, paying particular attention to your response to the question in step 3.34.

3.45 Press the Exit Service key. At the Service Mode dialog box, press the Revision #'s key to call up the Revision List dialog box. Use the scroll bar to navigate through the list and verify that each of the items identified in FIGURE 23. are at the proper CRC and version.

NAME	CRC	VERSION
BOOTUP	c14f	1.42
PREBOOT	5791	1.42
PROTO	b5fa	1.42
SYSTEM1MGR	aed5	1.42

FIGURE 23. Service Mode Revision #s

Press the 'OK' key to close the Revision List dialog box. Press the 'OK' key to close the Service Mode dialog box. Press the 'To Primary Keys' button then press the 'Setup Notebook' button. Select the 'About' tab to call up the 'About System Software' dialog box. Verify that all items identified in FIGURE 24. are at the proper CRC and version.

NAME	VERSION	CRC
NM6400	3.01	33AE
Volume Pressure		
Oxygen	1.14	738C
Gas Analysis	1.16	0D96
Integrated Patient Monitor,		
(if installed)	1.05	E406
Strip Chart Recorder,		
(if installed)	1.02	FED3

FIGURE 24. Service Mode Revision #s

3.46 Attach the SW 3.01 label P/N 4117725 above the serial number label at the back of the machine where shown in FIGURE 25. If an option requiring a Keylok was enabled, attach its corresponding label above the SW 3.01 label.

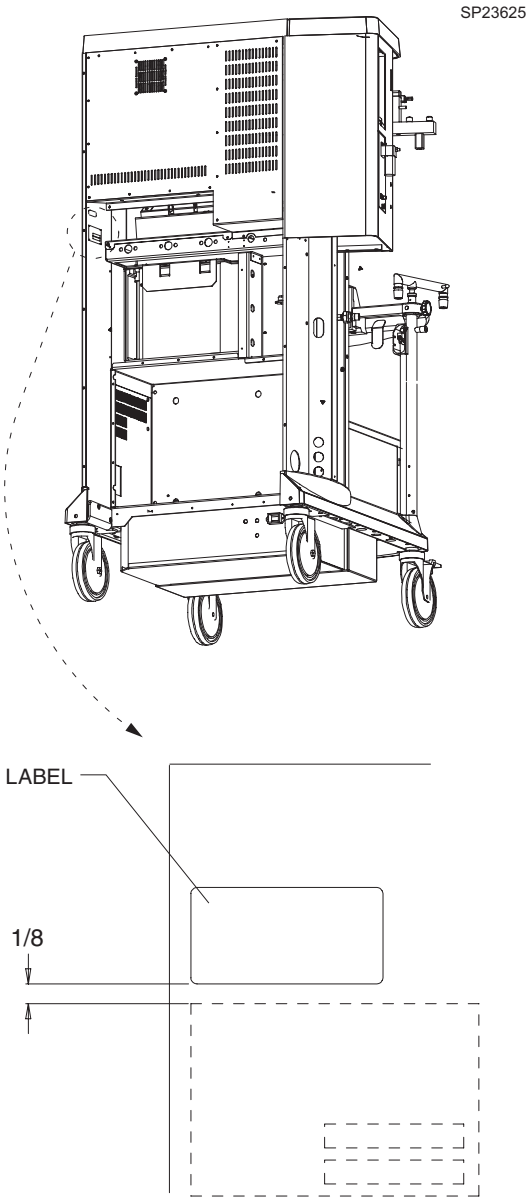

FIGURE 25. Label Installation

3.47 Touch the Update tab in the NM6000 CONFIGURATION to access the UPDATE page. (Refer to Accessing the Service Screens in Section 2.4.2 of the Narkomed 6000 Series Technical Service Manual.) If any PBS versions are displayed in red boxes, touch the corresponding area on the screen to initiate a PBS update.

When the key is pressed the notebook disappears. Press the Service Config key to refresh the Service Config notebook and to select additional pods for download, if required. After all downloads are completed, they will reset and reference the latest pod-based software versions. Then turn the System Power switch to Standby. See FIGURE 26.

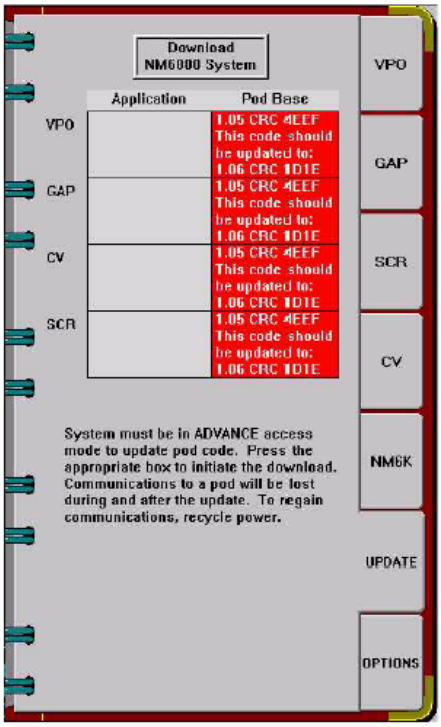

FIGURE 26. PBS Screen

NOTE: Communication will be lost during this update. This is normal and communication will be regained after cycling power.

3.48 Turn the NM6000 System Power switch to ON and verify the software options are available, and all pod base software versions are 1.06 and CRC value 1D1E.

3.49 Locate the Operator's Instruction 3-ring binder assembly. Locate and discard the existing Narkomed 6000 Anesthesia Machine Operator's manual and replace it with the updated version of this manual P/N 4114915-009.

3.50 If the machine is fitted with an IPM pod, locate and discard the existing Integrated Patient Monitor Option for the Narkomed 6000 Anesthesia Machine manual and replace it with the updated version of this manual P/N 4116574-003.

3.51 Set the ventilator to Volume mode ventilation. Press 'To Secondary Keys' on the taskbar. Then touch the 'Low Flow Wizard' key and verify that the Low Flow Wizard is enabled. (If activation of this feature is not desired, verify that it cannot be enabled.) Set the ventilator to Standby.

3.52 Perform the following calibrations and tests:

- 5.4 - O2 Off Set
- 5.5 - Pressure Zero and Span
- 6.2 - Pressure Monitor
- 6.12 - Oxygen Analyzer
- 6.13 - Flowmeters/ Gas Concentrations/ EFG Measurement
- 6.17 - Divan Operational
- 6.22 - Electrical Safety (if hardware modifications were performed)
- 6.23 - Final Checks

Refer to Sections 5 and 6 of the Narkomed 6000 Series Technical Service Manual.

If applicable, also perform the IPM test procedure given in Section 6A of the Narkomed 6000 Series Technical Service Manual.

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